

ENHANCED AIR COOLING OF ELECTRONIC DEVICES USING FLUID PHASE CHANGE
HEAT TRANSFER

ABSTRACT

A cooling apparatus for an electronic module, to enhance air cooling of electronic devices using a closed loop, phase change fluid heat transfer mechanism to transfer thermal energy from electronic devices to air cooled fins. The evaporator includes a surface for making thermal contact with an electronic module to be cooled. The boiling chamber is disposed within the evaporator, and includes a plurality of fluid inlet ports disposed near one end, and a plurality of fluid outlet ports disposed near an opposite end. The condenser includes a plurality of tubes and a plurality of thermally conductive fins. Each tube is in fluid flow communication with one fluid inlet port and one fluid outlet port, forming a fluid flow path. Each fin is in thermal contact with one or more tubes. A check valve is disposed within each fluid flow path proximate an inlet port.